



## Old Heavy-Duty Diesel Engines: Oregon's Public Health Problem

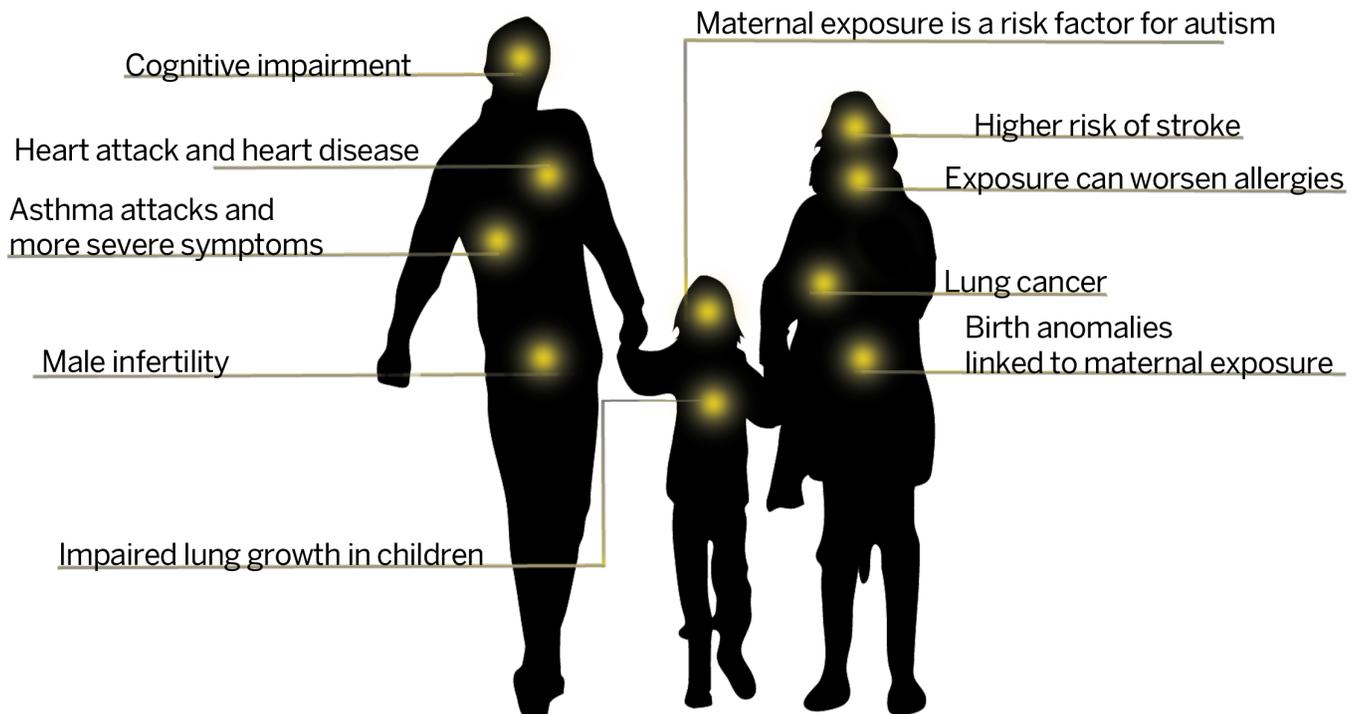
"In pediatrics, we want to prevent kids from getting sick. We are asking parents to take individual action. But there's nothing we can do to get them to prevent exposing their kids to air pollution. It's only good public policy that can help protect kids in that way." — **Dr. Paul Lewis, MD, MPH; Tri-County Health Officer**

### Estimated annual health impacts from diesel in Oregon:



Estimates of health effects are based on an EPA analysis using 2005 National Air Toxics Assessments

### Health effects associated with exposure to diesel pollution:





## Testimony before the Oregon Senate, February 23, 2017

**Diesel exhaust consists of particles and gases including 44 toxic substances.**

**At least 80% of diesel exhaust is microscopic sooty particles so small that, when inhaled, they can enter the bloodstream and lodge in the brain, heart and placenta.**

**Infants and children, elders, and those with health problems are at highest risk of harm.**

“What is it that is special about diesel that warrants additional controls? Well, it penetrates deep into the lung. It goes past the defenses that we all have. What we’re talking about with diesel is a tiny, tiny particle...they actually get into the gas exchange regions [of the lungs]. We can see these particles transferred to the heart tissue...and the brain.”

— William Lambert, Epidemiologist, OHSU

### **Dementia and cognitive function**

“A concern for diesel in particular, where there’s a high emissions rate for nano-particles and ultrafine particles, they can actually reach the brain directly through the olfactory bulb. A study was able to visualize these nano-particles within the brain tissue. This research area is still very much emerging.”

— Dr. Perry Hystad, Epidemiologist, OSU

### **Children and lung function**

“We worry about pregnancy and exposure to the developing fetus, and children and their developing lungs. Lung growth is less if you live in areas with a lot of particulate pollution. You actually end up growing less lung.”

— Dr. Paul Lewis, MD, Mph, Tri-County Health Officer

### **Cancer**

“Some of the most carcinogenic [elements of diesel exhaust] are not very volatile, so they wouldn’t on their own be airborne. But they can become airborne because they adhere to these particles. So the particle becomes the vehicle to move this more potent [element] into the lung that would not normally get there through inhalation.”

— Dr. David Farrer, toxicologist, OHA

Health outcomes	Short term exposure (days)	Long term exposure (weeks/years)
Cardiovascular mortality	+	+
Cardiovascular hospitalization	+	-
Ischemic heart disease	+	+
Heart failure	+	-
Ischemic stroke	+	-
Vascular disease	-	+
Altered heart rate variability	+	-
	+	-
Strong epidemiological evidence	Moderate epidemiological evidence	Some epidemiological evidence

Brook RD, Franklin B, Cascio W, et al. Air Pollution and Cardiovascular Disease A Statement for Healthcare Professionals From the Expert Panel on Population and Prevention Science of the American Heart Association. *Circulation* 2004; 109: 2655–71.



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